# PLAN TO FLY THERE

## Objectives

The students will:
Create a simple flight plan.
Role-play the communication process pilots use.
Identify the components of a flight plan.
Determine a quantity by using a map scale.

## Standards and Skills

**Science**
Physical Science

**Science Process Skills**
Communicating
Measuring

**Mathematics**
Problem Solving
Communication
Connections

## Background

It would be very difficult to build a house without a plan. A builder depends on the plan to provide information about the design and size of a house under construction. Plans can also be used to describe an action or sequence of events such as planning for a celebration.

The pilot of an airplane depends on a *flight plan* to provide information to help ensure a successful flight to a destination. The plan may contain the following information:

1. Aircraft number (identification)
2. When the flight will leave (departure time)
3. Where the plane will takeoff from (departure point)
4. How it will get there (route of flight)
5. Where it will land (destination)

6. How long it will take to fly there (estimated time en route)
7. When the flight will land (estimated time of arrival)
8. Color of the airplane
9. The pilot's name

Abbreviations and codes are used on flight plans to save space and reduce the number of words. For example, the code for San Francisco International Airport in California would appear on the flight plan as SFO.

The pilot plans the route of flight by connecting a series of points on an *aeronautical chart*. These points are abbreviated, and are listed on the flight plan to describe the route of flight.

Pilots use a radio or telephone to communicate or "file" flight plan information with a Flight Service Station.

Once the airplane is airborne, *Air Traffic Control (ATC)* controllers use the information on flight plans to help track airplanes, and to maintain a safe distance between airplanes.

Talking on a radio or telephone can sometimes change the sound of words and letters. For example the letter B sounds like the letter P and the letter C sounds like the letter D. Most of the information on the flight plan is abbreviated or coded using letters and numbers. To help eliminate mistakes caused by a change in the sound of a letter, pilots use the *International Phonetic Alphabet*.

The International Phonetic Alphabet assigns word sounds to every letter in the alphabet. Instead of saying the letter A, pilots say the word Alpha. The code SFO would be stated Sierra Foxtrot Oscar.

**Materials**

Barrier (a screen, portable chalkboard, bookcase, etc.)
Paper and pencil
Noise source (radio static simulated by crumpling cellophane)
Copies of student Flight Plans
Copies of student Aero-Charts
Radios or walkie-talkies (optional)

## Preparation

Make copies of the Student Pages for each student.
Student Pages can be used to prepare students for this activity.

The Aero-Chart Student Page is used as a work sheet by the students to determine such factors as departure airport, destination airport, route of flight, and flying time in hours. Students complete the Flight Plan Student Pages by answering questions on the form.

Different airplanes travel at different speeds. Pilots determine the time en route based upon the cruising speed of their airplane. Students determine how long it will take to fly a route by using the icon at the bottom of the chart to scale the time. The length of one icon equals 1 hour flying time in the airplane. Example: If the course is 5 icons in length, it will take 5 hours to fly the distance. The students decide the departure time and add the flying time to determine arrival time at the destination airport.

The students can role-play the communication of flight plans between pilot and air traffic controller. Set up listening stations with chairs on either side of the barrier and have the students talk to each other in a normal voice level. If walkie-talkies are available, students could be in different rooms.

Introducing background noise near the stations can simulate real world problems pilots have when communicating with radios. Radio transmissions are sometimes unclear because of static or interference, which can change phonetic sounds.

## Activity

1. Hand out a copy of the Aero-Chart and of a flight plan to each student. (Students can work in pairs or small groups for this activity)

2. Ask the students to choose any departure and destination airport shown on the chart.

3. Ask the students to mark a route between the two airports by connecting the lettered dots. Write the route on the flight plan. Note: Routes do not have to be "direct" to an airport. Consider what might influence the choice of a particular route; examples include mountain avoidance, restricted areas, flight time limits because of fuel tank capacity, and sightseeing en route.

4. Using the time icon (located at the bottom left corner of the Aero Chart Student Page), have the students determine the amount of time the flight will take. Enter this in the flight plan.

5. Ask the students to decide on a departure time and add the flight time to determine the arrival time. Add this information to the flight plan.

6. Have the students complete the flight plan by adding an aircraft identification and pilot's name.

7. To simulate talking on a telephone or radio, divide the students into pairs with a barrier between them. Ask one student in each pair to "transmit" the flight plan information to the other student and have them write down the information as they receive it.
8. The students can exchange flight plans to see if the information matches.

## Discussion

1. What would you do if you had to communicate with Air Traffic Controllers in Italy? The *international language for air traffic control is English. Controllers in Italy and most countries communicate using the English language.*

2. Do pilots have to use a flight plan? *Pilots are required to use flight plans certain types of flights. For example, pilots flying commercial airliners are required to use flight plans. Many other pilots use flight plans voluntarily for safety reasons; if a flight plan is not cancelled on time, government agencies are notified so search and rescue operations may begin to locate the pilot and airplane filed on the flight plan.*

3. Can pilots change a flight plan? *Yes, flight plans can be changed by talking to a Flight Service Station.*

## Extensions

1. Have students plan a flight route using a chart they create.

2. Invite a pilot to the classroom to talk about flight plans.

3. Have students draw a picture of what they would see on an airplane flight over a city or farm.

4. Have the student spell his or her name using the phonetic alphabet.

5. Prominent landmarks such as radio towers, race tracks, and mountains are depicted on aeronautical charts to help pilots navigate. Pilots also use landmarks to specify their location when communicating on the radio to flight controllers and air traffic. Have students review the route of their flight and describe how they used landmarks to navigate.

6. Have students identify local landmarks that pilots could use for navigation.

## Assessment

1. Have the students complete a flight plan using the International Phonetic Alphabet.

2. Ask the students to create a chart scale for distance.

3. Create a walk/bike plan to describe how a student could get to a friend's house.

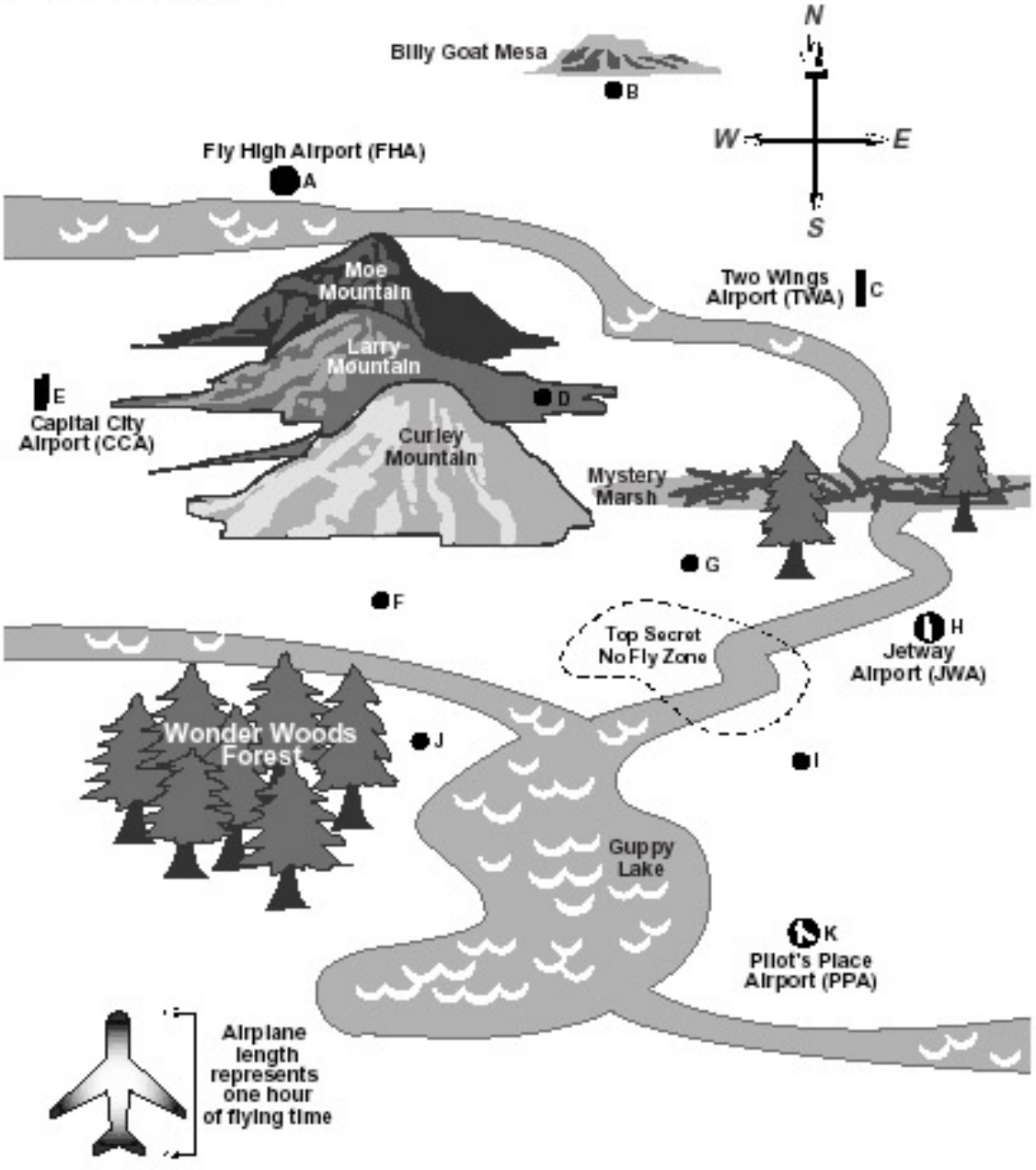
4. Create a travel plan for getting to school.

## International Phonetic Alphabet

| | | | |
|---|---|---|---|
| A | ALPHA | N | NOVEMBER |
| B | BRAVO | O | OSCAR |
| C | CHARLIE | P | PAPA |
| D | DELTA | Q | QUEBEC |
| E | ECHO | R | ROMEO |
| F | FOXTROT | S | SIERRA |
| G | GOLF | T | TANGO |
| H | HOTEL | U | UNIFORM |
| I | INDIA | V | VICTOR |
| J | JULIET | W | WHISKEY |
| K | KILO | X | X-RAY |
| L | LIMA | Y | YANKEE |
| M | MIKE | Z | ZULU |

# Plan to Fly There

## Aero-Chart



# Plan to Fly There

Directions

1. Look at the Aero-Chart Student Page and use it as a worksheet to help plan your trip.
2. Use the Aero-Chart to answer some of the questions on the flight plan below.
3. Fill in the blank spaces on the form to create a flight plan.

Aircraft Identification

1. What is my airplane's number?

_____

Departure Time

2. What time will we leave?

_____

Departure Airport

3. From what airport will we leave?

_____

Route of Flight

4. How will we get there?

_____

Destination of Trip

5. Where will we land?

_____

Estimated Time En Route

6. How many hours will it take to get there?

_____

Arrival Time

7. What time will we land?

_____

Aircraft Color

8. What color is my airplane?

_____

Name of Pilot

9. What is my name?

_____

# Plan to Fly There

## Official Pilot's Flight Plans

### Pilot's Flight Plan

Aircraft Number_____ Departure Time_____
Departure Point_____

Route of Flight_____
Destination_____

Estimated Time En Route_____ Arrival Time_____
Color of Aircraft_____

Name and Address of Pilot
_____

### Pilot's Flight Plan

Aircraft Number_____ Departure Time_____
Departure Point_____

Route of Flight_____
Destination_____

Estimated Time En Route_____ Arrival Time_____
Color of Aircraft_____

Name and Address of Pilot
_____

# WE CAN FLY, YOU AND I

## INTERDISCIPLINARY LEARNING ACTIVITIES

### Science

- Create a classroom model of an airport terminal.
- Collect and interpret weather maps from the local newspapers.
- Discuss what kinds of science would be important for pilots to study and understand. Why?
- Discuss why weather is an important factor for aircraft to fly safely.
- List and discuss environmental concerns when constructing a new airport in any community.

### Mathematics

- Discuss what the numbers on a runway mean.
- If traveling to different times zones, determine what the local time will be when reaching the destination.
- Make a graph comparing the distances flown by the rotor motor, bag balloon, and delta wing glider.
- Determine how many years elapsed between different time line events.

### Technology Education

- Discuss technology that contributes to airport safety
- Discuss the importance of computers on aircraft and in airports.

### Fine Arts

- Make a mobile using aviation as a theme.
- Design or draw the layout of an airport.
- Design art that depicts what airports will look like in the future.